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7 JUL 1959

MEMORANDUM FOR: ███████████████████████

SUBJECT: Estimation by Statistical Techniques of Tons Originated
             on Communist China's Railroads in 1958

REFERENCE: Services Division China Committee Minutes, 19 March 1959

1. The following explanation and attached worksheet are offered in answer to your request regarding the details of the statistical method used to estimate tons originated on the Chinese railroads in 1958.

2. Comparison between Rate of Growth of Modern Transport and Production of Selected Commodities

A multiple correlation between tons originated by the railroads and the production of coal, cement, and ferrous minerals and metals in Communist China was computed for the years 1950-57. These commodities were chosen because they may be considered the key commodities both from the standpoint of transport and industrial growth in the stage of economic development in which Communist China is at present. The three commodities constitute roughly 40 percent of the tonnage originated by the railroads. The coefficient of correlation was found to be .99, or nearly perfect correlation between the commodities as the three independent variables and rail tons originated as the dependent variable.

In a study of freight transportation and industrial growth in India the same general relationship was found to be true for other countries in early periods of economic development and with comparable conditions such as size of country and geographical distribution of resources. In the USA during 1890-1915, the USSR during 1928-55, and India during 1931-55, the ratio of freight turnover to the output of these selected commodities maintained a more or less steady pattern. 1/

One would expect the same relationship to be true in 1958 in Communist China, judging from the nearly perfect correlation in 1950-57 and the evidence from other countries. To determine whether this was the situation in 1958, the 1958 production estimates were substituted in the regression equation for the multiple correlation and the equation solved to find the independent variable. The results showed that with production estimates of 270 million tons of coal, 11 million tons of cement, and 96 million tons of ferrous minerals and metals, the tonnage originated by the railroads should have been 920 million metric tons.

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1/ ██████ India, Railway Board. Indian Railways, vol. 3, no. 6, Sep 58, p. 519. U.

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The Chinese Communists announced the much lower performance
of 380 million tons originated, a figure which should be 37 percent
higher if it were to show the same increase over 1957 as was shown by
the production estimates. If, however, production estimates for 1958,
which exclude the vast quantities of handicraft or native production
not included in the data for 1950-57, are substituted in the regression
equation (coal, 208 million tons; cement, 8.7 million tons; and ferrous
products, 51 million tons), the resulting figure for tons originated is
385 million tons. This is only one percent higher than the announced
performance of 380 million tons.

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Attachments:
  Worksheets